



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/658,784	09/11/2000	Ivo Raaijmakers	ASMEX.236A	4439

20995 7590 08/13/2003

KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER

ZERVIGON, RUDY

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/658,784

Applicant(s)

RAAIJMAKERS ET AL.

Examiner

Rudy Zervigon

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-14, 18-22, 61, 67-85, 87-95 and 103-116 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-14, 18-22, 61, 67-85, 87-95 and 103-116 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 May 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. Claims 61, 67, 103, and 110 are rejected under 35 U.S.C. 102(e) as being anticipated by Tanaka et al (USPat. 6,234,107). Tanaka teaches a load-lock chamber (12; Figures 6, 7; column 6, lines 45-69) that defines a lower portion (60) and an upper portion (52). The load lock comprises:

- i. A first port (14') and a second port (10), the first and second ports for moving a wafer (W) into and out of the load lock (column 7, lines 19-53)
- ii. a movable platform (55; column 7, lines 7-18) including a wafer carrier (56)
- iii. the wafer carrier being moveable between a first position where the wafer carrier is in the first chamber (lower chamber) and a second position where the wafer carrier is in the auxiliary chamber and the elevator plate substantially seals ("hermetically closed space 52" column 7, lines 10-18; column 6, lines 59-65) the auxiliary chamber from the first chamber
- iv. A substrate handling chamber (16, Figure 1,6) selectively communicating with the load lock chamber (12, Figure 1) through the first port

At least one process chamber (1-3, Figure 1; column 3, lines 20-38) selectively communicating with the substrate handling chamber

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Art Unit: 1763

3. Claims 9-13, 57, 68, 70-73, 75, 76, 107-109, and 113-116 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (USPat. 6,234,107) in view of Nering, Eric A. (USPat. 6,280,134). Tanaka teaches a load-lock chamber (12; Figures 6, 7; column 6, lines 45-69) that defines at least partially a first chamber / lower chamber (60) and an auxiliary chamber / upper portion (52) that is removably attached to the first chamber/lower chamber (see differing hatching of figures 4-7). The load lock comprises:

- v. A first port (10) and a second port (14'), the first and second ports for moving a wafer (W) into and out of the load lock (column 7, lines 19-53)
- vi. an elevator plate/ movable platform (55; column 7, lines 7-18)
- vii. the wafer carrier being moveable between a first position where the wafer carrier is in the first chamber (lower chamber) and a second position where the wafer carrier is in the auxiliary chamber and the elevator plate substantially seals ("hermetically closed space 52" column 7, lines 10-18; column 6, lines 59-65) the auxiliary chamber from the first chamber
- viii. the first port (10 of item 12, Figure 6, 7) communicates with a wafer handling module (16, Figure 6, 1)
- ix. the second port (14' of item 12, Figure 6, 7) communicates with a clean room via a wafer handling module (4, Figure 1)
- x. A treatment gas injector (58, Figure 6,7) for injecting a treatment gas. The specific gas is an intended use of the apparatus. Tanaka is inherently capable of supplying the desired gas.

Art Unit: 1763

- xi. At least one process chamber (1-3, Figure 1; column 3, lines 20-38) selectively communicating with the substrate handling chamber
- xii. Tanaka teaches heating elements in the auxiliary chamber (42, Figure 5).

Tanaka does not teach that his wafer carrier is attached to the elevator plate.

Nering teaches a similar wafer boat transfer mechanism (Figure 3a) including a wafer carrier (19a) attached to the elevator plate (23a; column 4, lines 20-44).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Saeki to attach his wafer boat to the elevator plate as taught by Nering

Motivation for Saeki to attach his wafer boat to the elevator plate as taught by Nering is to prevent the carrier from moving while in transit on the supporting elevator.

4. Claims 2, 4-8, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saeki (USPat. 5,223,001) in view of Nering, Eric A. (USPat. 6,280,134). Saeki teaches a load-lock chamber (1, Figures 1-4, and 6) that defines at least partially a first/lower/[first housing] chamber (13/14 interface space) and an auxiliary chamber / upper portion (36 – “(small space)”; column 8, lines 22-25) removably connected to the first / lower chamber (44, Figure 6). The load lock comprises:

- xiii. A first port (13) and a second port (14), the first and second ports for moving a wafer (4) into and out of the load lock (“carry-in and carry-out”; column 8, lines 9-15)
- xiv. an elevator plate/ movable platform (38; column 8, lines 20-30) including a wafer carrier (item between 38 and 4)
- xv. the wafer carrier being moveable between a first position where the wafer carrier is in the first chamber (lower chamber) and a second position where the wafer carrier is in the

Art Unit: 1763

auxiliary chamber and the elevator plate substantially seals (column 8, lines 24-33) the auxiliary chamber from the first chamber, wherein the first and second ports open into the first chamber when the elevator plate is in the second position

- xvi. the load-lock is formed at least in part by a first housing - item 28; Figure 2A of the present application corresponds to the lower portion that is bolted to item 41, Figure 6 of the Saeki patent
- xvii. the load-lock is formed partially by an auxiliary housing portion - item 30, Figure 2A of the present application corresponds to item 41, Figure 6 of the Saeki patent
- xviii. the auxiliary chamber, or upper chamber, includes inner walls made of aluminum and are adapted to withstand HF gas as an auxiliary fluid (Figure 6; column 8, lines 49-54; "cleaned gas", column 6, lines 64-68). The specific gas supplied to the upper chamber is an intended use of the apparatus. Saeki is inherently capable of supplying the desired gas.
- xix. A substrate handling chamber (30, Figure 5) selectively communicating with the load lock chamber (1, Figure 5, 6) through the first port
- xx. At least one process chamber (15, Figure 5; column 9, lines 56-69) selectively communicating with the substrate handling chamber through the first and second ports
- xxi. Saeki teaches the wafer carrier being movable between an outside position where the wafer carrier is outside the load lock and an inside position where the wafer carrier is inside the load lock - Figure 2, 4

Saeki does not teach that his wafer carrier is attached to the elevator plate.

Nering teaches a similar wafer boat transfer mechanism (Figure 3a) including a wafer carrier (19a) attached to the elevator plate (23a; column 4, lines 20-44).

Art Unit: 1763

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Saeki to attach his wafer boat to the elevator plate as taught by Nerring

Motivation for Saeki to attach his wafer boat to the elevator plate as taught by Nerring is to prevent the carrier from moving while in transit on the supporting elevator.

5. Claims 3, 20-22, 87-95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saeki (USPat. 5,223,001) and Nering, Eric A. (USPat. 6,280,134) in view of Kondo et al (JP06-275703). Saeki and Nering are discussed above. Saeki and Nering do not teach a heater in the elevator plate or that the wafer carrier is adapted for receiving only a pair of substrates. Kondo teaches a load lock room (10, Figure 1) including a wafer carrier (7) adapted for receiving a plurality of substrates and an elevator plate (14) with a heater (20).

Motivation for Saeki and Nering to use Kondo's wafer carrier and elevator plate heater is for sizing the number of wafers held to thus optimize the throughput for the load lock and for pre-heating the substrates prior to subsequent processing for using Kondo's heater ([0018] of computer translation). It is well established that dimensional differences in apparatus would be obvious to change by one of ordinary skill in the art at the time the invention was made (Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for Saeki and Nering to carry 2 wafers as taught by the use of Kondo's wafer carrier that has an elevator plate heater.

Art Unit: 1763

6. Claims 14, 69, 77-85, 104, 105, 111, and 112 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (USPat. 6,234,107) in view of Kondo et al (JP06-275703). Tanaka is discussed above. However, Tanaka does not teach a wafer carrier adapted for receiving only a pair of substrates on plural shelves. Kondo teaches a load lock room (10, Figure 1) including a wafer carrier (7) adapted for receiving a plurality of substrates on a plurality of shelves, an elevator plate (14), and a heater (20).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Tanaka to use Kondo's wafer carrier with plural elevator plates / shelves and an elevator plate heater.

Motivation for Tanaka to use Kondo's with plural elevator plates / shelves and an elevator plate heater is for a larger throughput in production for using the wafer carrier and for pre-heating the substrates prior to subsequent processing for using Kondo's heater ([0018] of computer translation).

7. Claim 106 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (USPat. 6,234,107) in view of Saeki (USPat. 5,223,001) and Fujiura et al (USPat. 5,071,460). Both Tanaka and Saeki are discussed above. Tanaka does not teach his auxiliary chamber, or upper chamber, including inner walls that are adapted to withstand an auxiliary fluid that is HF vapor. Saeki does teach, as discussed above, his auxiliary chamber or upper chamber, including inner walls that made from aluminum and are thus adapted to withstand an auxiliary fluid that is HF vapor as demonstrated by Fujiura aluminum chamber construction withstanding HF vapor (column 8, lines 51-65).

Art Unit: 1763

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Tanaka to make his load-lock chamber from Saeki's taught aluminum material as demonstrated by Fujiura.

Motivation for Tanaka to make his load-lock chamber from Saeki's taught aluminum material is for the well known durability against fluorine containing vapors as demonstrated by Fujiura.

8. Claim 74 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (USPat. 6,234,107) and Nering, Eric A. (USPat. 6,280,134) in view of Saeki (USPat. 5,223,001) and Fujiura et al (USPat. 5,071,460). Both Tanaka, Nering, and Saeki are discussed above. Tanaka does not teach his auxiliary chamber, or upper chamber, including inner walls that are adapted to withstand an auxiliary fluid that is HF vapor. Saeki does teach, as discussed above, his auxiliary chamber or upper chamber, including inner walls that made from aluminum and are thus adapted to withstand an auxiliary fluid that is HF vapor as demonstrated by Fujiura aluminum chamber construction withstanding HF vapor (column 8, lines 51-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Tanaka and Nering to make his load-lock chamber from Saeki's taught aluminum material as demonstrated by Fujiura.

Motivation for Tanaka and Nering to make his load-lock chamber from Saeki's taught aluminum material is for the well known durability against fluorine containing vapors as demonstrated by Fujiura.

Art Unit: 1763

Response to Arguments

9. Applicant's arguments with respect to claims 7, 9, 14, and 22, including the dependents, have been considered but are moot in view of the new grounds of rejection.

10. Applicant's argument that Tanaka does not teach "an upper portion" as amended is not convincing. Tanaka teaches both an upper chamber that is a "portion" of the overall structure.

Conclusion

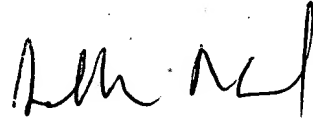
11. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry

Art Unit: 1763

of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.

A handwritten signature in black ink, appearing to read "Jeffrie R. Lund".

JEFFRIE R. LUND
PRIMARY EXAMINER